


Project Abstracts for PhD Student Recruitment AY2025/26

Department of Biology

Project title	Plant Biotechnology, Terpenoid and Lipid Metabolism, and Synthetic Biology		
Research Clusters	<input type="checkbox"/> Creative Media/Practice <input checked="" type="checkbox"/> Health and Drug Discovery <input type="checkbox"/> Data Analytics and Artificial Intelligence in X <input type="checkbox"/> Humanities and Cultures	 <p data-bbox="1499 883 1696 915">Dr LIAO Pan</p> <p data-bbox="1304 967 1583 1029">Email address: panliao@hkbu.edu.hk</p> <p data-bbox="1304 1073 1717 1170">Learn more: https://biol.hkbu.edu.hk/people/academic_staff_detail/179</p>	
Keywords	<i>Biotechnology, Biochemistry, Volatiles, Terpenoids, lipids</i>		
Project abstract	<p>This research focuses on Plant and Food Biotechnology, aiming to enhance health-promoting and valuable natural products. By exploring plant biochemistry and metabolism, we aim to uncover pathways for valuable natural products and understand their regulation, transport, and release in plants. Our goal is to develop novel strategies to produce and increase the yield of value-added compounds. Additionally, we seek innovative methods to protect plants against stresses, thereby improving seed yield and nutrient content. This multidisciplinary approach promises significant advancements in agricultural biotechnology, food security and healthcare.</p>		

Project title	Microbial conversion of CO ₂ to biodegradable polyhydroxyalkanoates (PHA)	
Research Clusters	<input type="checkbox"/> Creative Media/Practice <input checked="" type="checkbox"/> Health and Drug Discovery <input type="checkbox"/> Data Analytics and Artificial Intelligence in X <input type="checkbox"/> Humanities and Cultures	<div data-bbox="1423 396 1772 829" data-label="Image"> </div> <div data-bbox="1423 837 1772 870" data-label="Caption"> <p>Dr PRADHAN Nirakar</p> </div> <div data-bbox="1304 919 1612 984" data-label="Text"> <p>Email address: npradhan@hkbu.edu.hk</p> </div> <div data-bbox="1304 1024 1682 1130" data-label="Text"> <p>Learn more: https://scholars.hkbu.edu.hk/en/persons/NPRADHAN</p> </div>
Keywords	<i>Polyhydroxyalkanoates (PHA); CO₂ utilization; Microbial fermentation; Metabolic pathway optimization; Genetic modifications</i>	
Project abstract	<p>This project seeks to innovate the production of biodegradable polyhydroxyalkanoates (PHA) by utilizing CO₂ as a feedstock through improved microbial fermentation methods. Given the pressing challenges of plastic pollution and climate change, the research will concentrate on optimizing the metabolic pathways of microorganisms to effectively convert CO₂ into high-quality PHAs. We will examine advanced fermentation techniques, such as co-culturing and genetic modifications, to enhance yield and the properties of the polymers. Additionally, the project will assess the scalability of the production process and evaluate the environmental impact of PHA biodegradation across different ecosystems.</p>	